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Wellness Trends among Battlefield Airmen

**Genny M. Maupin, MPH; Mark J. Kinchen, MS;
Brittany L. Fouts, BS**



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**Air Force Research Laboratory
711th Human Performance Wing
School of Aerospace Medicine
Aeromedical Research Department
2510 Fifth St.
Wright-Patterson AFB, OH 45433-7913**

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14. ABSTRACT U.S. Air Force Battlefield Airmen (BA) are an elite group of warfighters whose duties require members to remain in peak physical condition to maintain mission readiness. The substantial financial, material, and personnel resources required to train and maintain this elite group may be burdened by attrition and shortened careers due to illness and injury. Wellness, diet, and exercise trends offer insight into performance enhancement and injury prevention. Secondary data analyses were performed on annual health assessment data to summarize wellness trends. Descriptive analyses were conducted on the four main BA career fields (combat controllers, pararescuemen, tactical air control party, special operations weather technicians), BA as a whole, and Security Forces (SF) as a control group. From 2006 to 2012, the dietary profile of BA was consistent with a low-fat healthy intake. There was a steep 5-year increase in the use of nutritional supplements. BA tend to exercise longer and more intensely in both aerobic and strength conditioning per week than their SF counterparts. Approximately 70% have no significant sleep issues. For both groups, alcohol use has decreased in both frequency per month and frequency of consumption per sitting. Overall tobacco use has remained relatively constant, with SF smoking more and BA using chew tobacco more.					
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1.0 SUMMARY

U.S. Air Force Battlefield Airmen (BA) are an elite group of warfighters whose duties require members to remain in peak physical condition to maintain mission readiness. The substantial financial, material, and personnel resources required to train and maintain this elite group may be burdened by attrition and shortened careers due to illness and injury. Wellness, diet, and exercise trends offer insight into performance enhancement and injury prevention.

Secondary data analyses were performed on annual health assessment data to summarize wellness trends. Descriptive analyses were conducted on the four main BA career fields (combat controllers, pararescuemen, tactical air control party, special operations weather technicians), BA as a whole, and Security Forces (SF) as a control group. From 2006 to 2012, the dietary profile of BA was consistent with a low-fat healthy intake. There was a steep 5-year increase in the use of nutritional supplements. BA tend to exercise longer and more intensely in both aerobic and strength conditioning per week than their SF counterparts. Approximately 70% have no significant sleep issues. For both groups, alcohol use has decreased in both frequency per month and frequency of consumption per sitting. Overall tobacco use has remained relatively constant, with SF smoking more and BA using chew tobacco more.

2.0 INTRODUCTION

U.S. Air Force (USAF) Battlefield Airmen (BA) are an elite group of warfighters whose duties require a substantial degree of physical and mental strength, agility, stamina, and discipline. These Special Operations (SO) personnel require a great deal of resources to train and maintain operational readiness and manpower levels. These BA include combat controllers (CCT), pararescuemen (PJ), tactical air control party members (TACP), and SO weather technicians (SOWT). The wellness, diet, and exercise trends of BA and SO forces offer crucial insight into injury prevention and performance enhancement.

Throughout the past several decades, the emphasis on optimizing personnel health and human performance in the United States has increased. This has led to the growth in the use of dietary supplements, vitamins, and performance enhancers as well as a shift in wellness, diet, and exercise trends [1]. Approximately 37.2% of military personnel reported using supplements and/or multivitamins on a daily basis [2], and the general U.S. population and service members are assumed to be at the same risk for potential adverse effects of these supplements [1]. Because of this, it is important to assess the wellness, diet, and exercise trends of the military population to prevent potential adverse effects and injuries as well as enhance the performance of elite warfighters.

The Institute of Medicine's Committee on Military Nutrition Research found that military personnel need a higher intake of protein to minimize potential muscle loss during high-energy expenditure during strenuous tasks and prolonged missions. Popular supplements among the military population include protein powder to sustain endurance, as well as the herb *Rhodiola rosea*, commonly known as roseroot, and citrulline malate. Military personnel often use caffeine-enriched products such as Stay Alert chewing gum and a beverage called ERGO (Energy Rich, Glucose Optimized) to prolong their physical ability to conduct a mission [1].

Military personnel are also required to be in top physical condition, and because of this, there is a high interest in diet control and weight control supplements. It has been estimated that increased body weight among active duty Air Force members has cost nearly \$23 million per

year in extra costs, with \$4 million from loss in duty days and \$19 million in medical care costs [3]. While maintaining a healthy diet is essential in weight control, active duty personnel reported consuming a diet of healthy foods less than the rates recommended by nutritional standards [2]. When diet and exercise regimens fail to produce the results desired, weight control supplements are often used. Hydroxycut, a popular weight loss product, is one of the biggest sellers to military personnel and was only second to multivitamin supplements [1].

The 2011 *Department of Defense Health Related Behaviors Survey of Active Duty Military Personnel* investigated Armed Forces, including Army, Navy, Marine Corps, Air Force, and Coast Guard active duty personnel, and found that military personnel met five out of eight Healthy People 2020 objectives (obesity, healthy weight, exercise, seat belt use, and motorcycle helmet use), but they did not meet the objectives for cigarette use, smokeless tobacco use, and binge drinking. Through analysis of this survey, 74.9% of active duty personnel reported completing moderate or vigorous physical activity in the past 30 days but 24.5% reported cigarette use in the past 30 days, which was higher than the estimated use by civilians of 20.6%. A total of 12.8% of service members reported using smokeless tobacco in the last 30 days and 33.1% reported binge drinking in the last 30 days [2].

While there is some literature on the wellness, diet, and exercise trends in the military as a whole, very little is known about these trends in some military subpopulations such as BA and SO forces due to their unique characteristics compared to other military subpopulations. BA and SO forces are required to have a higher level of physical fitness, they have a lower population of women in their forces, and there are different behavior patterns between these elite warfighters and other military subpopulations [1]. Because of this, this project aims to fill a capability gap identified by the Air Force Special Operations Command to answer the question: How do we survey BA and analyze data of conditioning/wellness trends? General wellness data are readily available through the Web-Based Health Assessment given annually to all USAF active duty members as part of their physical examination. Perhaps these data are sufficient to provide a useful picture of BA wellness and exercise habits. It is prudent to analyze existing data before conducting a new survey.

The aim of this study was to summarize specified wellness trends among BA over a 7-year period (2006-2012). Wellness metrics included diet, exercise, and other behavioral habits.

3.0 METHODS

A retrospective cohort study was conducted of 3,413 enlisted, male USAF BA on active duty between calendar years 2006 and 2012, which represents the total identifiable population (N=all). Subjects were selected from Air Force Personnel Center databases based on Air Force Specialty Code (AFSC): 1C2X1, 1C4X1, 1T2X1, and 1W0X2, where X=3, 5, 7, or 9. By conditioning on X, this ensured personnel were at the apprentice, journeyman, craftsman, or superintendent skill levels. These AFSCs represent the following career fields: CCT, TACP, PJ, and SOWT. The SOWT AFSC was only available for years 2008-2012.

Security Forces (SF) personnel were chosen as a control group, since, like BA, they are a largely male, enlisted population with a high frequency of deployment. Since SF are a generally younger population than BA, control subjects were matched on age as well as gender. Age was defined as the age the subject entered the study cohort. From the available pool of 44,265 active duty, male SF with AFSC 3P0X1 (where X=3, 5, 7, or 9) between 2006 and 2012, 3,413 (8%) age- and gender-matched controls were randomly selected.

Data from the Web-Based Health Assessment were obtained; service members complete this questionnaire at their annual health physical. These data were used to identify trends in sleep, diet, nutritional supplements, performance enhancers, multivitamin use, exercise, and alcohol and tobacco use. Post-deployment health assessment and post-deployment health reassessment data were also obtained to determine overall health scores after deployment. Data were merged with the Air Force Personnel Center data at the individual level.

Analyses were largely descriptive in nature; however, some chi-squared statistics were performed to investigate differences between the study and control groups. A p-value of less than 0.05 was considered statistically significant. All data management and statistical analyses were performed using SAS version 9.2 (SAS Institute, Inc., Cary, NC.).

This project was determined to be non-human use by the Air Force Research Laboratory Institutional Review Board.

4.0 RESULTS

4.1 Demographics

TACP make up the majority of BA (58%); BA are largely airmen (63%) as opposed to non-commissioned officers (NCOs) (see Table 1). BA did not differ from SF with regard to rank ($\chi^2(1)=2.1717$, $p=0.1406$).

Table 1. Demographic Characteristics of USAF Active Duty BA and Selected SF, 2006-2012

Characteristic	CCT n (%)	PJ n (%)	SOWT n (%)	TACP n (%)	BA n (%)	SF n (%)
Age (yr)	761 (22.30)	562 (16.47)	105 (3.08)	1,985 (58.16)	3,413	3,413
18-20	127 (16.69)	6 (1.07)	3 (2.86)	463 (23.32)	599 (17.55)	599 (17.55)
21-25	308 (40.47)	250 (44.48)	26 (24.76)	875 (44.08)	1,459 (42.75)	1,459 (42.75)
26-30	155 (20.37)	190 (33.81)	30 (28.57)	318 (16.02)	693 (20.30)	693 (20.30)
31-51	171 (22.47)	116 (20.64)	46 (43.81)	329 (16.57)	662 (19.40)	662 (19.40)
Airmen	472 (62.02)	331 (58.90)	32 (30.48)	1,321 (66.55)	2,156 (63.17)	2,097 (61.44)
NCOs	289 (37.98)	231 (41.10)	73 (69.52)	664 (33.45)	1,257 (36.83)	1,316 (38.56)

4.2 Overall Health

Regarding the overall health of BA and SF after immediate return to garrison after deployment, BA appear to be healthier. Within 3 to 6 months after deployment, the difference between the two groups is slightly larger. While in garrison, BA still appear healthier, but both BA and SF appear to have a slight drop in overall health compared to post-deployment health (see Table 2).

Table 2. Overall Health of USAF Active Duty BA and Selected SF, 2006-2012

Overall Health	BA		SF		Chi-squared p-value
	n	%	n	%	
Asked within 4 wk of return from deployment					
Overall, how would you rate your health during the past month?					0.0005
Excellent, very good, or good	2,949	97.27	1,802	95.39	
Fair or poor	83	2.74	87	4.60	
Asked within 3 to 6 mo of return from deployment					
Overall, how would you rate your health during the past month?					0.0003
Excellent, very good, or good	1,543	95.84	1,048	92.66	
Fair or poor	67	4.16	83	7.34	
Asked at annual health exam in garrison					
How is your health right now?					0.7040
Excellent, very good, or good	2,745	90.53	1,704	90.21	
Fair or poor	287	9.47	185	9.79	

4.3 Diet

In terms of diet, there is essentially no difference between the BA and SF population. Approximately 95% of BA eat a balanced diet from all five main food groups (Figure 1). Over 95% eat three or more servings of fruit and vegetables per day (Figure 2). Approximately 80% of BA eat whole grain breads, cereals, raw fruit or raw vegetables 2 days per week or less with SF at 75% (Figure 3). Eighty-five percent of both groups eat high-fat foods such as hamburgers, cheeseburgers, fried chicken or fish, French fries, whole or 2% milk, cheese, hot dogs, bacon, sausage, or chips 2 days a week or less (Figure 4).

4.4 Supplements, Megavitamins, and Performance Enhancers

In terms of nutritional supplement use, approximately 78% of BA and 79% of SF currently include supplements in their diet. There has been a steep increase in supplement use since 2007. Megavitamin use in both groups has risen to 20% over the 6-year study period. Both groups had less than a 10% use of herbal therapies or performance enhancers (see Figure 5 for illustration).

4.5 Exercise Type and Duration

In terms of exercise, whether light, moderate, or vigorous aerobic training or strength training, the data indicate distinct differences between BA and SF. BA exceeded their SF counterparts in mean days per week for vigorous aerobic conditioning, moderate aerobic conditioning, and strength training. Figure 6 illustrates that BA exercise nearly a full day more per week in all of these categories.

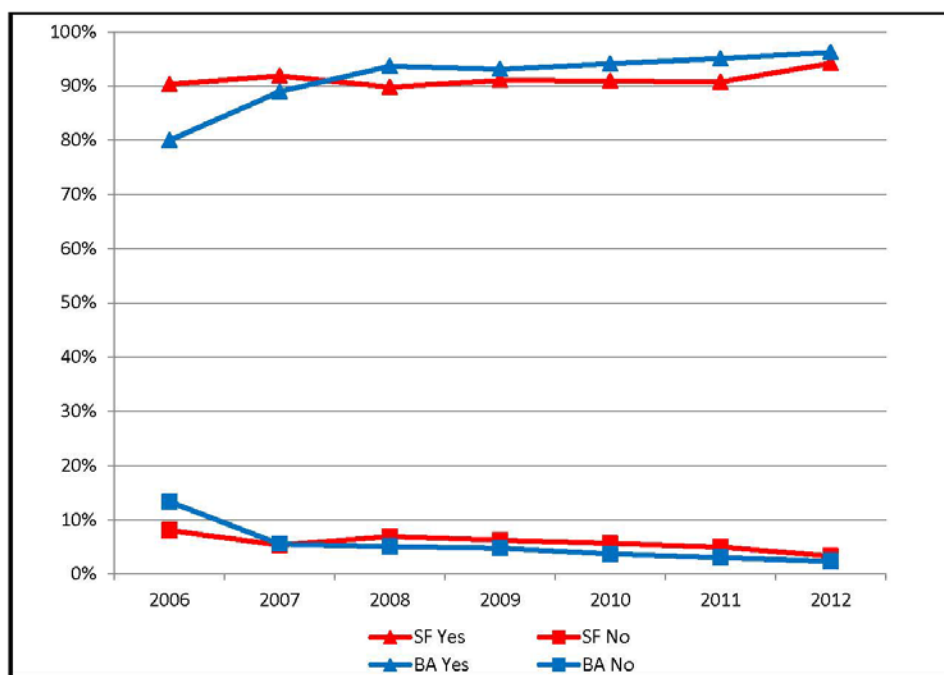


Figure 1. Proportion of responses, by calendar year, to the question: “Do you eat a wide variety of foods in your overall diet, including a variety of foods from all five main food groups?”



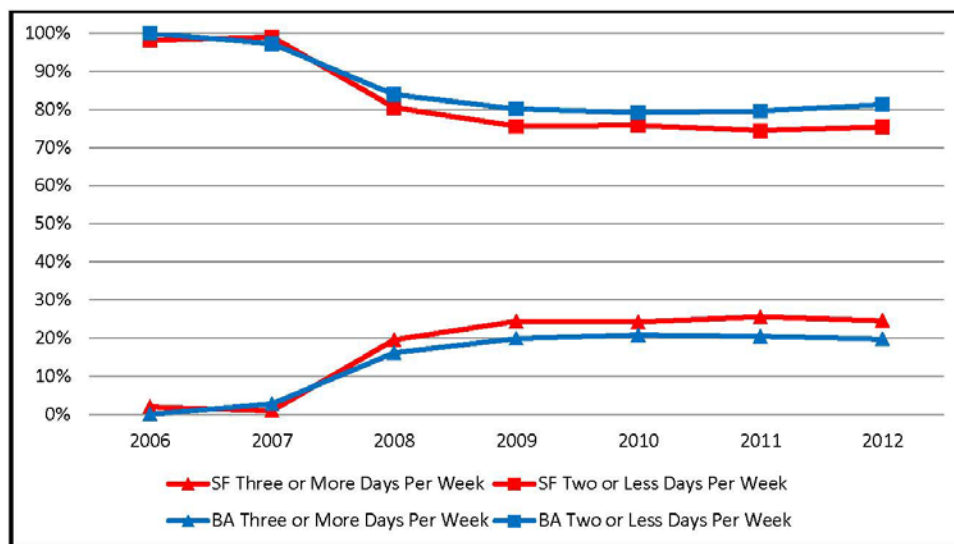


Figure 3. Proportion of responses, by calendar year, to the question: “How often do you eat foods such as whole grain breads, cereals, bran, raw fruit, or raw vegetables?”

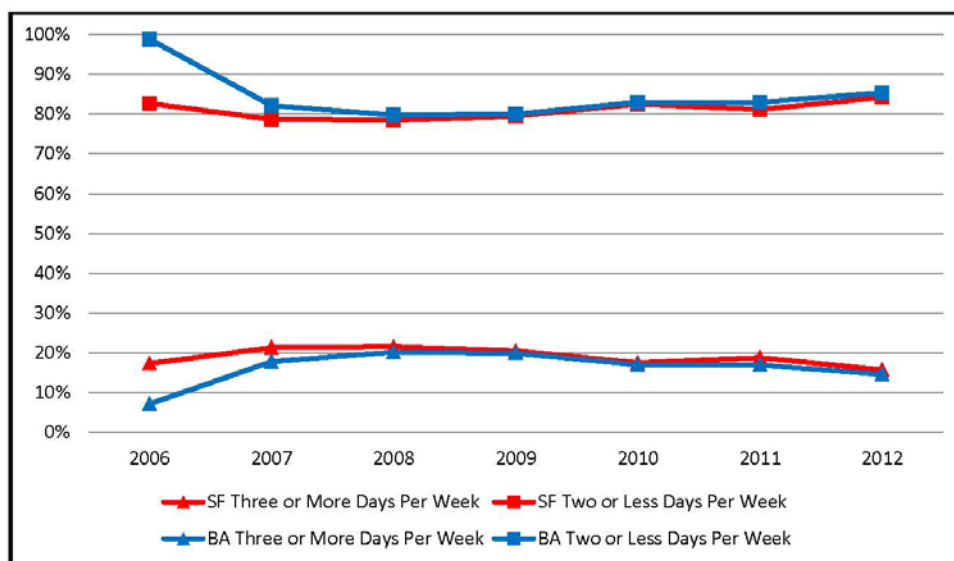


Figure 4. Proportion of responses, by calendar year, to the question: “How often do you eat high-fat foods such as hamburgers, cheeseburgers, fried chicken or fried fish, French fries, whole or 2% milk, cheese, hot dogs, bacon, sausage, or chips?”

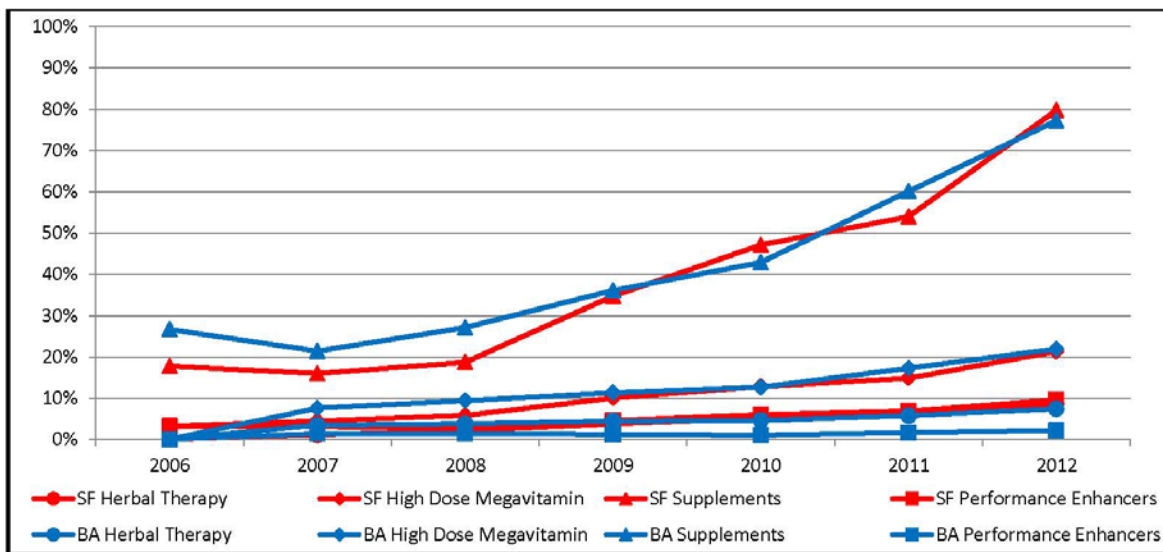


Figure 5. Proportion of responses, by calendar year, to the question: “Which of the following do you routinely take?”

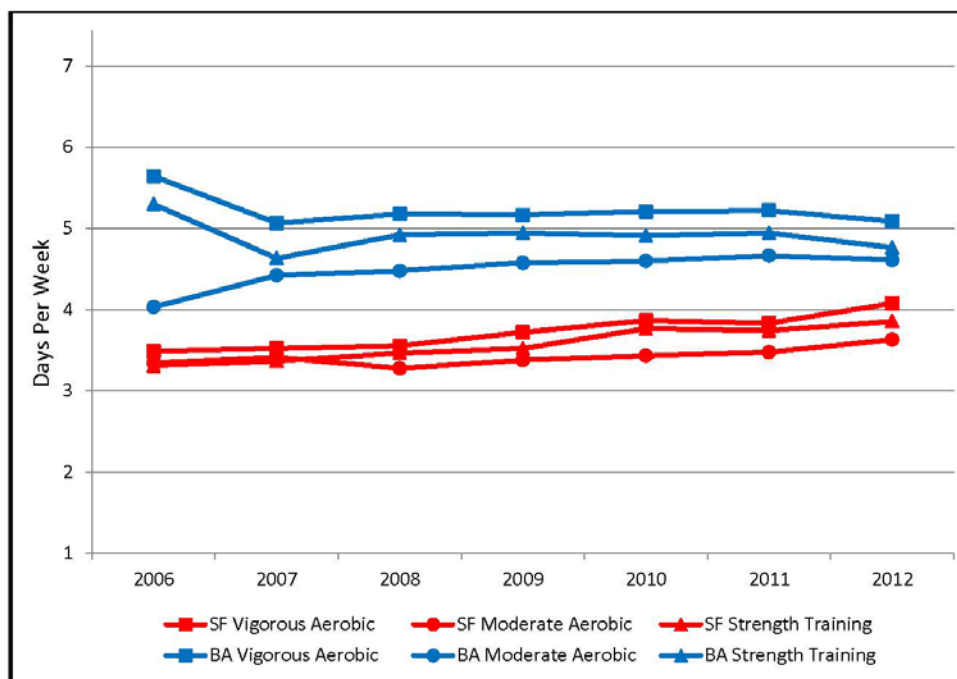


Figure 6. Proportion of responses, by calendar year, to the question: “What kind of exercise do you engage in?”

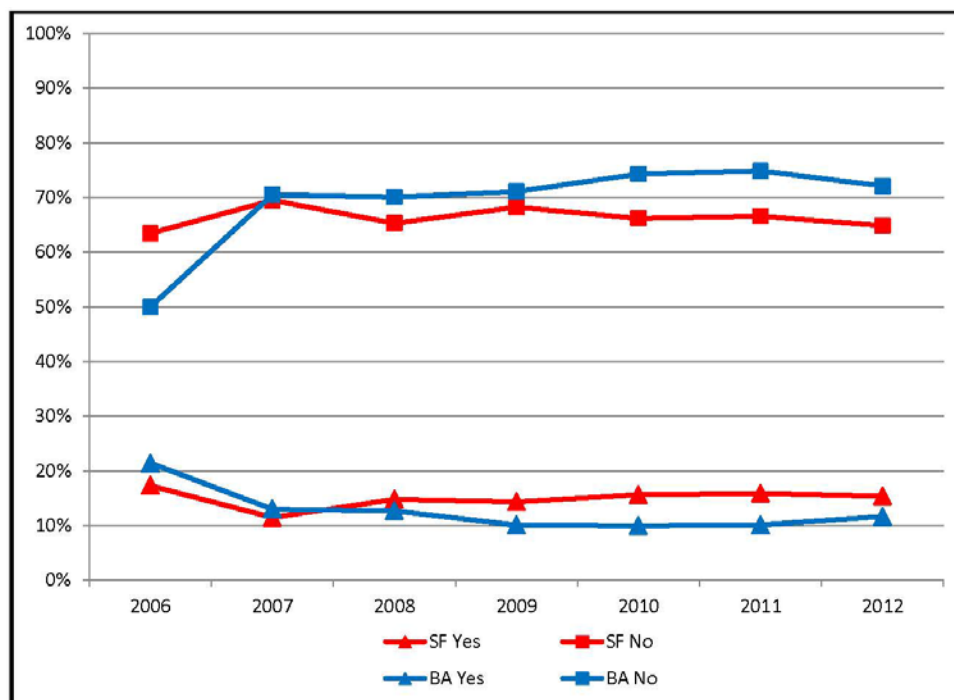


Figure 7. Proportion of responses, by calendar year, to the question: “Regarding your sleep habits, do you often get less than 5 hours sleep on three or more consecutive nights?”

4.6 Sleep Habits

There appears to be only slight differences in sleep patterns between the two groups. Approximately 70% of BA and 65% of SF have no significant sleep problems. The data show that 15% of SF and only 11% of BA get less than 5 hours of sleep on three consecutive days or more per week (see Figure 7).

4.7 Alcohol Use

Alcohol consumption and frequency of consumption are relatively comparable between BA and SF. Approximately 90% of both groups tend to drink alcohol once a week or less, and 80% responded to drinking only one or two drinks each time. An interesting trend over the last 4 years is that heavier drinkers are drinking less frequently and are consuming less per incident (see Figures 8 and 9).

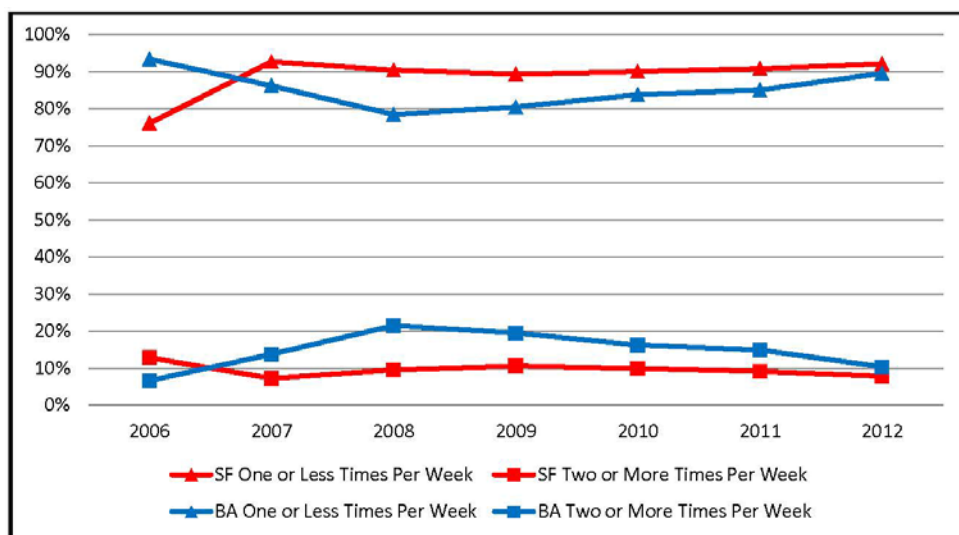


Figure 8. Proportion of responses, by calendar year, to the question: “How often do you have a drink containing alcohol?”

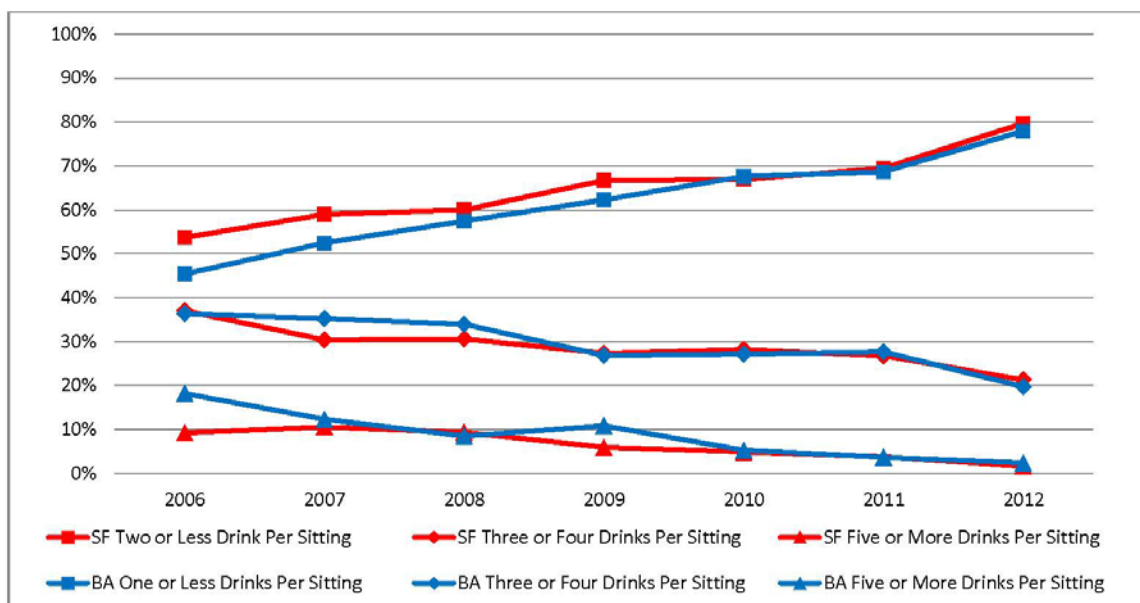


Figure 9. Proportion of responses, by calendar year, to the question: “How many drinks containing alcohol do you have on a typical day when you are drinking?”

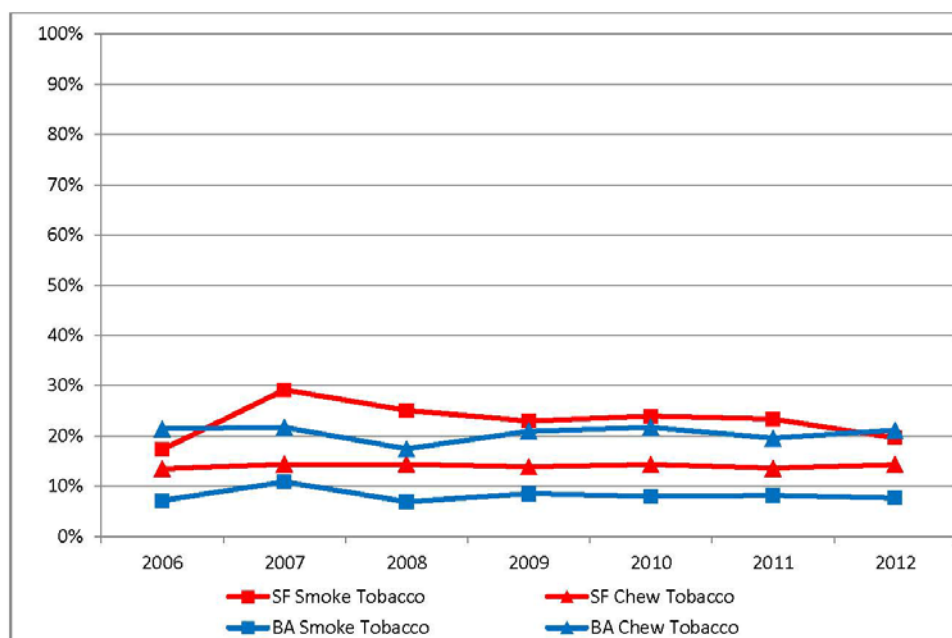


Figure 10. Proportion of responses, by calendar year, to the question: “Do you currently use any of the following tobacco products?”

4.8 Tobacco Use

In contrast to alcohol consumption trends, tobacco use has remained relatively constant over the study period. There were differences in the types of tobacco consumed by BA and SF. Nearly 20% of SF currently smoke tobacco compared to less than 10% for BA. In contrast, just over 20% of BA chew tobacco of some form and approximately 15% of SF chew (see Figure 10).

5.0 DISCUSSION

Both BA and SF appear to eat a healthy and well-balanced diet, with more than 75% using some form of nutritional supplements. It is also shown that BA exercise more days per week and with more intensity in both aerobic conditioning as well as strength training. Of note is the apparent trend of decreasing use of alcohol and the relative consistency of tobacco use.

The data used did present some limitations. The annual health assessment is an online questionnaire and as such was susceptible to survey fatigue, as well as the risk that the respondent would either answer not truthfully or not answer at all. The questionnaire was also in beta testing until 2008; therefore, data for 2006-2007 were limited.

Certain questions that may provide negative consequences for the respondents, such as alcohol consumption frequency and amount, may have a learning response associated with them. For example, it was found that both the frequency and amount of alcohol consumed by respondents have decreased over the time of the analyses, 2006-2012. It is suspected that many of the answers to the questions are not truthful, to avoid negative consequences, and reduce the reliability of the data.

It is suggested that further study be performed on the types of dietary supplementation and performance enhancers that BA use, as the data are poorly captured by the online questionnaire.

6.0 REFERENCES

1. Institute of Medicine. Use of dietary supplements by military personnel. Washington, D.C.: The National Academies Press; 2008.
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LIST OF ABBREVIATIONS AND ACRONYMS

AFSC	Air Force Specialty Code
BA	Battlefield Airmen
CCT	combat controller
NCO	non-commissioned officer
PJ	pararescuemen
SF	Security Forces
SO	Special Operations
SOWT	Special Operations weather technician
TACP	tactical air control party
USAF	U.S. Air Force